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MYSTICAL MATHEMATICS

APPLIED TO

MOON-HAULING,

OR,

THE SCIENCE OF NON-ENTITIES,

As fully set forth in

THE NEW REQUISITE TABLES,

Published by Order of the BOARD OF LONGITUDE;

**In Four EXTREMELY EXTREME EXEMPLIFYING
PROBLEMS;**

AND THE

CORRESPONDENCE, on that SUBJECT,

BETWEEN

NAUTICUS and the COMPILER,

As published in the GAZETTEER.

L O N D O N :

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M.DCC.LXXXVI.

[PRICE ONE SHILLING.]

P R E F A C E.

THE Writer of the following sheets is perfectly aware into what oblivion the temporary nature of the subject will naturally propel them; and he is likewise conscious that the public can little care for either party's arguments, or for whosoever may have the advantages of reason and truth, in the present contest. But, within every man's breast, (except in the most depraved,) there is placed a principle, which cautions him to preserve his character, among those who honour him with friendship. Those, to whom the author is known, and of whose esteem he boasts himself careful, have urged him to exculpate his conduct, and prove the veracity of his assertions, by a fairly collected statement of the contest, and by plain reference to the principles of mathematics. In obedience, therefore, to friendly dictates, he throws before the public an impartial recital of the paper-war; and he trusts
be

*he shall stand excused in making use of the weapons
that justice has occasionally offered to him,—ridicule
and irony.*

—ridentem dicere verum

Quid vetat ?



MYSTI-

MYSTICAL MATHEMATICS.

*Scientia quævis, à justitia et reliqua virtute sejuncta, calliditas,
non autem sapientia, videtur esse.*

PLATO.

NEVER did a man more-unwillingly take up his pen in his own justification than the writer of this, who, though compelled to it by the illiberality of his opponent, will endeavour as much as possible not to defile paper in like manner, but leave the reader to conceive what language would have best retaliated the abuse.

In December, 1785, Nauticus, having occasion to examine some of the examples in the new Requisite Tables, published by order of the Board of Longitude, was surprised to find them such as could not exist in the nature of things, although they were there introduced as elucidations of rules, established, on the clearest geometrical principles, by Mess. Lyons and Dunthorne; men, who, in their profession, were ornaments to their country.

The consequence was the following letter, published in the Gazetteer, Dec. 20, 1785.

A

Numb.

TO ASTRONOMERS.

Gentlemen,

I Am a seaman, and can say I have seen many fights, sailed at all seasons, studied the situations of the sun, Saturn, and satellites; and have stated, in several simple schemes, the best methods of determining the longitude. But, of all the fights I have seen, I never saw the solution of an impossible triangle, till, in my last voyage, I was reading the new Requisite Tables, published by order of the Commissioners of Longitude. The preface of this useful book is larded with the names of many mighty men, who have assisted the astronomer-royal in the compilation of the work, *sed, mirabile dictu!*—We there see wonders! Two miracles wrought! (examples 3d and 4th, pages 35 and 36!) Two triangles solved, in which the observed distances are considerably greater than the respective zenith distances of the objects observed. In the first, one side is greater than the other two by above three degrees; in the other, nearly six degrees. This would have been laughed at two thousand years ago. Surely we are not to have mysteries in the mathematics, as well as in mythology; but perhaps without them the mystic ministers of M—— will miss the money taken for the passport into the wooden world, long the habitation of

NAUTICUS.

Before the publication of the above, another egregious example was discovered, which, (who could have thought it?) upon examination, proved to be one of those mentioned above, solved after Mr. Lyon's method, *improved*. This was the occasion of the following letter, published in the Gazetteer, Dec. 26, 1785.

Numb.

TO ASTRONOMERS.

ADDENDUM to my last Letter in the GAZETTEER of the 20th
Instant.

Gentlemen,

IN the Requisite Tables, published by the authority of the Commissioners of Longitude, I have since discovered a more egregious error than the two before mentioned, viz. in page 31, example the IVth, the sun's zenith distance is given about 71 degrees, the moon's 19 degrees, and the apparent distance of their centres 103 1-half degrees, consequently impossible; for one side of the triangle is longer than the other two by above 13 degrees. Shame! Shame! How degraded is the dignity of a British astronomer!

NAUTICUS.

A fourth equally horrid blunder, example III. p. 30, of the Requisite Tables, was discovered the same day, which proved to be the other example mentioned in N° I. solved after Mr. Lyons's *improved* method. A few days after, the following angry letter, N° III. appeared in the Gazetteer, which was followed by N° IV. Feb. 3, 1786, being a partial reply from Nauticus, who confines himself to one example only, and does not even notice the possibility or impossibility of the mistake of the ill-made 4 for a 7, but leaves the rest of the filth *ad referendum*; which never would have been seen by the public, had not the illiberal rejoinder, N° V. appeared in the Gazetteer, April 29, 1786, containing a repetition of the principal part of N° III. and a curious conclusion, or *ne plus ultra*, anglicé, *not an inch beyond his nose*.

The two notes following N^o V. appeared in the Gazetteer, one in April, the other in May; the first of which, Nauticus surmises, must relate to N^o V. as he knows of no other late astronomical dispute in the Gazetteer.

Numb. III.

To the EDITOR of the GAZETTEER.

SIR,

Dec. 31, 1785.

IN your Gazetteer of the 20th instant a person, under the signature of Nauticus, has censured two examples which are made use of in the New Tables, requisite to be used with the Nautical Almanack, and in your paper of yesterday he has repeated his attack. The directors, as well as the compiler of that work, always feel themselves obliged to those who tell them, in a friendly way, of any errors which have crept into that work; and they will make a proper use of their information, let it come in what way or with what design it will.

The examples he censures were taken from real observations, and no error has been committed by the compiler in the first of them; I mean that on p. 30 and 35. This example was selected for the purpose of exemplifying an extreme case; namely, that where the objects are on or near the same vertical circle; and it is possible the editor might choose this example for the very reason that Nauticus founds his objections on. It is certainly better on that account; for if Nauticus had employed himself in making useful observations, instead of "studying the situations of Saturn and his satellites," by means of which we may conclude his "simple schemes for the best methods of determining the longitude" are effected, he would have known by experience that the best observers are liable to some errors in observing altitudes, both of the moon and stars, in the night-time, and especially when they are very near the zenith, or very near the horizon. And when the objects are nearly on the same vertical circle, since these errors are as likely to be in excess as in defect, it is not improbable

bable that the circumstance which has happened in the observation, from which this example is taken, may frequently happen in others, which might puzzle a beginner; but this example will shew him, that, in working by either of the methods which this is worked by, no error or puzzle whatever can arise from it. This is a circumstance which the sagacity of a critic, ignorant in a great measure of the subject he writes on, and determined to find fault only, would never discover.

In the 4th example, the editor undoubtedly committed a mistake, in taking an ill-made 4 for a 7; and as that example also is taken from a real observation, he did not examine into the agreement of the several parts of the triangle in the manner he most likely would have done, if he had formed it out of his own mind; but it would be affectation to express much sorrow on the occasion, because the error creates no absurdity in the operation; nor can any person be either puzzled or led wrong by it. The editor of the Requisite Tables has long been convinced, from experience, that nothing which is the production of his head or hands will be perfect: Nauticus, if we may judge from the arrogant and triumphant manner in which he writes, and the contempt and scurrility with which he treats those he thinks have slipped into error, has not yet learned that he also is subject to imperfections; yet, unfortunately for him, in his first essay, though it consists but of 25 lines, he has committed as many errors as he accuses the compiler of committing in a pretty large octavo volume, of the most difficult matter. He says, "In the first, one side [of a triangle] is greater than the other two by above three degrees; and in the other *nearly six degrees.*" Now, if this brilliant critic had been able to add two numbers together, and take a third ~~cm~~ their sum, he must have seen that the excess is *more than thirteen degrees!* He also asserts, that the editor has solved two triangles, in each of which one side is greater than the sum of the other two; a falsehood which must either have originated in his ignorance of the meaning of the word he uses, or in the insolence of not regarding what he writes, while he thinks himself safe from detection under the mask of an anonymous signature; for the editor has not resolved any triangle in the operations which

he alludes to. But this is a trifle to what he has done in his second essay. He has, since he wrote his former, discovered the first of these mistakes, and has now introduced it as a *third* mistake of the editor's, with (if possible) more insolent triumph than he had found himself able to express before. Surely, when a man points out the mistakes of another, and, without the least provocation, treats him with contempt and scurrility on account of them, he should be exceedingly careful not to make more mistakes himself than he accuses the other of; much more ought he to be careful not, by his own blunders, to exhibit the same error twice over for different ones, and, tinker-like, make more holes than he mends.

It is impossible to say what villainous meaning is intended to be conveyed by the words "perhaps without them [the mistakes he had been exposing *] the mystic Ministers of M—— will miss the money taken for the passport into the wooden world." I have observed above, that Nauticus seems to have no scruples of conscience about him, while he writes *with safety* under the mask of an anonymous signature: but the compiler of the New Requisite Tables dares him, or any other person, to mention, under his real name, a single instance where he has been concerned in any such dirty work as appears to be hinted at by them; and if he cannot, after such an insinuation, the public will be at no loss for the *first* name (it cannot be the Christian name) which ought to be annexed to *Nauticus*.

The Compiler of the Requisite Tables.

P. S. This, and several other errors, will be given in the first publication which the Board makes; and a publication would have been made some time ago on purpose, if they had been of any importance.

* This is a reference curiously accurate. Vide No I.

February 3. 1786.

Quemadmodum qui expectant obsidionem omnia parant sub hostium adventum, ita adversus assultum iracundiæ præceptis philosophiæ muniendus est animus.

LITTLE did Nauticus think his alliterated allusions to the absurdities of an astronomer would have adduced the illiberal abuse announced in the Gazetteer of the 31st ultimo. Adieu, euphonic alliteration : come, ye children of Cadmus, in any order ye please ; and, O ye Genii, eldest sons of Arabs brains, who preside over the magic rules of addition and subtraction, descend, inspire your humble votary, clear his eyes from mist, let him not fall into error, nor mistake a quadrate four for a descending seven. Why so angry, *Mr. Compiler of the Requisite Tables* ? I hope you are not the person who took the observations, from which example II. page 35, is copied ; if so, I am sure Miss Nancy, with her nine-inch globe, or Master Jacky, with his four-inch Gunter's quadrant, would have determined the altitudes of the moon and star much nearer truth than three degrees fifty min. (the quantity the observed distance exceeds the two zenith distances) supposing them in the same vertical, and allowing half the error to each altitude. Unluckily for me, and luckily, or designedly, for, or by the compiler, the latitude and time are not given when the observations were taken. I have looked over the quarto volume of observations, published by Mr. Wales, which were made in his tour round the world, to see whether that gentleman ever observed so carelessly as to be out three or four degrees in one or both his altitudes together, but have perceived no such blunders. But, since Mr. Compiler builds so much upon this extremely extreme exemplifying case, let us examine that only, and leave the filth *ad referendum*. From the *data* there is a moral certainty that the observations must have been taken between or near the tropics ; that the objects were, one to the eastward and the other to the westward of the zenith, and that they must be in or very near the same vertical. Then, in the name of Euclid, why that prolix mystical solution ? Every one, who knows what parallax and re-

fraction mean, must know that their difference, added or subtracted, in such a case, to or from the observed distance, will give the true distance of the objects as truly as the *data* will admit: in all other *possible* cases there are shorter, plainer, and more easy, methods than any exhibited in the Requisite Tables, *Jed rísum tencatis!*

Mr. Compiler says, this extremely extreme exemplifying case may prevent a beginner from being puzzled: this indeed is a circumstance that the *sagacity* of none but a *critic* can discover. Again, it is certain that in the night the horizon is nearer the observer's eye than in the day, consequently the apparent altitudes will be proportionally greater; but this militates much against the possibility of the example being drawn from actual observation, if the solution be any thing near truth. Now to suppose all or the greater part of the error in the star's altitude, is not consistent with reason; therefore it must have been in the moon's; and, supposing it so, (but what hand must the observer have been!) the true distance in the example is jumbled out justly just.

For the honour of my country, I would advise that honourable board, the Commissioners of Longitude, to order the sheets containing the subject of this essay to be cancelled. Let us no longer be the laughing-stock of our neighbours, who have kicked the planet Georgium Sidus out of the heavens, and given its place to the indefatigable Herschel; printed our countryman Gardiner's Logarithms; afforded Poor Robin an opportunity of announcing to the public the transit of Mercury on the fourth of May this year as soon as the Nautical Almanack; also the disappearance and re-appearance of Saturn's ring in the years 1789 and 1790, neither of which were noticed by our Astronomers twelve months ago. — Shame! Shame! How degrading to the dignity of a British astronomer!

NAUTICUS.

Numb.

April 29, 1786.

To the EDITOR of the GAZETTEER.

SIR,

I. IN the Gazetteer of December 20, 1785, *Nauticus* asserts, that the Compiler of the Requisite Tables has solved two impossible triangles; whereas the Compiler has not solved any triangle whatever in the operations referred to.

II. *Nauticus* asserts also, that "the preface to that USEFUL book is larded with the names of many mighty men who have assisted the astronomer royal in the compilation of the work;" but every person, who will take the trouble of reading that preface, will see that there is but ONE person mentioned, as having any thing to do in the compilation of it.

III. In the Gazetteer of Dec. 26, 1785, *Nauticus* assured his readers, that he had found a third example of the Compiler's, more absurd than either of the two which he had taken notice of before; when the truth was, it was the same with one of them, in which *Nauticus* had himself blundered so egregiously as not to know it again.

IV. In the Gazetteer of February the 3d, *Nauticus* asserts that our neighbours "had afforded Poor Robin an opportunity of announcing to the public the transit of Mercury on the 4th of May this year as soon as the Nautical Almanack:" the real matter of fact is, that the transit of Mercury, though omitted in the Almanack for 1786, was inserted as an *erratum* in that for 1787, which was published in the autumn of the year 1783. No foreign Ephemerides, announcing that transit, reached England till the December following; and as Poor Robin is published annually about the middle of November, it is plain that writer could avail himself of it before November 1784, more than a year after the Nautical Almanack had made the transit public.

V. *Nauticus* is not more scrupulous of telling verbal lyes than written ones: he declared to several of the Compiler's friends and acquaintance, that he did not know who the Compiler was, or he would not have printed his first piece of elegant composition; yet
he

he admits, in that elegant morsel, that he had read the *larded* preface, where the Compiler's name and place of abode stand at full length.

Nauticus is pleased to ask, in his *facetious way*, "Why so angry, Mr. Compiler?" Mr. Compiler was never yet in a situation where he could not fully and truly answer even impertinent questions; and now assures Mr. *Nauticus*, that it was not the poignancy of his wit that made him so; though there can be no doubt but *Nauticus* thinks himself possessed of a wonderful fund of it: it is not uncommon for conceited persons to mistake their own ribaldry for wit. Neither was it because he has been detected in an error: he knows too well how subject he and every one, even *Nauticus* himself, are to it. But he was angry at finding his reputation attacked, in the most wanton and unprovoked manner, by a person with a mask on his face; and who, because he thought himself unknown, did not scruple to assert the most impudent falsehoods, and to accuse him of errors which he never committed; and not even content with that, but insinuating also that he committed them wilfully, and for the basest of purposes. Yet this man complains of being treated with illiberality and abuse!

Nauticus, in his last publication, has been weak enough to suffer the snake to be discovered by its tail. "There are shorter, plainer, and more easy, methods of reducing the distance than any exhibited in the Requisite Tables," which we are to suppose (believe it who will) the Board of Longitude has rejected; and therefore this mighty stickler for the honour of his country is resolved to be the first to pull it down, by insinuating that foreigners hold our publications, and particularly the Nautical Almanack, cheap: whereas it is well known, that this publication is held in the highest esteem all over Europe; that it is used every where, and expressly copied into their own Ephemerides; that no foreign publication of the kind comes near it, in the number and exactness of its original calculations; and that it reflects the highest honour on the Board of Longitude and the British astronomers who are concerned in it; and it is the fullest and most unequivocal proof of its merit, that the sale of it is continually and rapidly

ly increasing ; a very large impression being now constantly sold off long before the year commencing to which it belongs.

The Compiler of the Requisite Tables.

P. S. Since the above was sent to the printer, I have discovered the unfortunate step which has drawn down the wrath of MR. NAUTICUS upon me. This man is employed by Messrs. M. and P. to manufacture and new-vamp old books of navigation ; and, having learned that mathematical instrument-makers can divide quadrants with greater exactness into 96 parts than into 90, sagely concluded, that it would be a wonderful improvement to compute the tables of difference of latitude and departure to 96ths of a quadrant rather than to degrees, as is usual ; and had address enough to persuade his employers to adopt this absurdity, and print an edition of Hafelden's Seaman's Daily Assistant, with the tables so computed. As many of this book are used in the school which I am intrusted with the care of, a parcel of them was sent me ; but as it is my business to teach the children, committed to my care, navigation in a rational way, and not the wild schemes of Nauticus, I returned these books to our counting-house, and they were sent from thence to Messrs. M. and P. with a request that some of the old sort might be sent instead of them, as those were of no use to us. What passed between Mr. A. and his employers, in consequence of this, I cannot tell, nor yet how those gentlemen got rid of a large impression of such an absurd work ; but as another edition was printed immediately, and some of it sent to me, I never either thought or heard of this circumstance, which happened more than a year ago, till yesterday, when I was told that I had injured Mr. A. in the eyes of his employers ; that the Board of Longitude had neglected some of his schemes ; and that they had also withdrawn the sale of the Nautical Almanack from his employers. A long catalogue of injuries truly ! To which I shall add, that I have never seen any of their *twice-laid stuff* but the book above-mentioned, and that which *was* Atkinson's Epitome ; and I could point out as many errors in the first as would almost fill a column of the Gazetteer, and as many absurdities and inconsistencies in the latter as would fill another ; but having now placed Nauticus *in propria personâ* before the public,

lie, and also his actions, and motives for them, in their true colours, I have done with him. A fly may be very troublesome on a man's nose; but when he has brushed it off, and the pain ceases, the insect then becomes too contemptible to be pursued farther.

Note I. which appeared in the Gazetteer in April, 1786.

. *Mr. Wales complains of partiality without reason. The letter, to which his is an answer, was delayed longer than his manuscript; and such matters, as they are not of much importance, must give way to more temporary subjects.—His letter, he may be assured, shall be inserted the first open day. We are by no means interested or concerned about the controversy.—It is a mere astronomical dispute, and, knowing neither of the parties, we are indifferent how it terminates.*

Note II. which appeared in the Gazetteer in May, 1786.

. *The petulant and flimsy gentleman, who signs himself W. W. of Christ's Hospital, may be very easy; for it is not likely that we should insult our readers by any mention of a matter so trifling.*

Here ended our public news-paper contest. The following was written, and intended to be published through the same channel; but, on consideration, it was thought that a more extensive channel would be preferable, for several reasons; one especially, the difficulty the editor met with in finding room for such uninteresting matter.

To the EDITOR of the GAZETTEER.

JUST before your paper of the 29th of April was put into my hands, I had luckily read the XIVth chapter of Proverbs, verse 17, or, as sure as the Pole-Star is in the Little Bear's tail, I must have

have been two-thirds of three-fourths inclined to be angry with Mr. Compiler of the Requisite Tables; who seems to have forsaken not only the point in question, but even the very language of a gentleman and an astronomer, preferring that which cannot be said to belong either to a liberal education or to liberal sentiments. The ribaldry he has adduced in his last essay requires such a treatment as cannot be either amusing or interesting to your readers, therefore the reply, and further investigation of the matter, must be in another channel. However, I crave the favour of you to insert the remaining part, or *referenda*, of my last answer to his *polite and gentleman-like* essay of Dec. 31, 1785.

The many illiberal epithets bestowed, and equally illiberal expressions there used, cannot add much to the credit or support of the argument on his side, particularly the curious parathetic reference of the relative to its antecedent, (*vide* note, N^o III. p. 6,) by which one may surmise that this mighty man is not less capable of breaking Priscian's head than of cracking Euclid's scull. In the postscript he says, "This and several other errors will be given in the first publication the Board *makes*." Have there not been two different lists of *errata* already printed to the very book in question? Have not three Ephemerides, and several editions of those out of print, been published, by the order of the Board, since the Requisite Tables, without any notice being taken of the blunders alluded to, even of the ill-made 7? It is true, some trifling errors have been noticed;

ticed; but neither the defect of the natural sine of 45 degrees, nor some others, perhaps slips of the pen or neglects of the corrector, which it would ill-become Nauticus to take advantage of, though *lex talionis* would justify him so to do. Mr. Compiler takes advantage of the alliteration in N° I. and simply harps upon Saturn's satellites; then shelters himself (and a bad shelter it is) under the three sides given not making a triangle; but converts them into an arc of the same vertical, which every Tyro knows cannot be, except the Compiler can demonstrate that 89 degrees 58 minutes, and 86 degrees 8 minutes, of the same circle, are equal. Nauticus, for want of an expression, called the blunders impossible triangles, which, in fact, was calling them nothing. There are four of them, or two, twice told, and solved; neither *ens*, nor *ens rationis*; & *ex nihilo nihil fit*, except a perfect vacuum in the upper regions of somebody. Oh Lyons! oh Dunthorne! ye sleep in peace; but little did ye ever think your rules, established on geometry's strong base, could be so far improved as to out-geometrize geometry itself.

In N° V. the Compiler recapitulates, in great part, what he before had said, and numerically registers his assertions, which will be noticed in order.

I. This was answered above.

II. That

II. That the word *Compiler* was taken in too general a sense must be confessed; but, to use the Compiler's words, "*it would be affectation to express too much sorrow on the occasion;*" and, in the metaphorical sense of the word, every hod-carrier may be said to assist in compiling a building.

III. This has been answered before.

IV. Neither Nauticus nor many others had seen the preface to the Almanack for 1787. This is the only part of the last paragraph in N° IV. the Compiler has noticed. However, there has lately appeared a flying half-sheet, stuck into the Nautical Almanacks, containing the places of the Georgian Planet; but we are not told from what tables those places were calculated. *Our neighbours have published tables of the planet Herschel's motion.*

V. In reading this curious head the reader will be apt to conceive that the mask was pellucid, and that the snake was not in the grass with his tail only sticking out, notwithstanding Mr. Compiler's asseveration. It is true, Nauticus mentioned his reasons for publishing N° I. and II. to several persons, perhaps the Compiler's friends; and, for his sake, wished the matter had dropped; or that, like a gentleman, (to which character this paragraph gives the lye direct) he had acknowledged his errors, it would have spared much pain on both sides; for, as St. Paul says, "*it is hard to kick against the pricks, and to fight with beasts at Ephesus.*"

fus." The rest of this head is too scurrilous to merit attention, and speaks more against the author than words can express. There remains now but the postscript to notice; and I wish I could here be silent.

John Adams, a person well known at Waltham-Abbey, Ratcliff-Cross, and Edmonton, being unemployed, in his distress, in the year 1780, conceived that a quarter of the compass, divided into 96 parts, would be more convenient for seamen than the present division of 90, because every point of the compass would then consist of 12 parts instead of $11\frac{1}{4}$, and the quarter point of 3 parts instead of $2^{\circ} 48' 45''$, consequently fractions avoided, and the tables rendered more extensive and useful. Mr. Rust, of St. Catharine's, Mr. Adams's friend, a man of no small philanthropy, undertook to print and publish the said tables; and had caused some sheets to be printed, when the worthy gentlemen, whom the Compiler alludes to, sent to Mr. Rust and bought the copy, which was printed, sold, and esteemed by sensible men. Mr. Rust informed Nauticus, that one of his correspondents sent him word those tables were reprinted in Holland four years ago. It is true, some enemies to improvement, and others who could not perceive that those tables, in their operation, (but with more convenience,) were exactly the same as the former, cavilled at them; upon which the gentlemen immediately ordered the old tables to be printed.

What

What is become of so large an impression of that *absurd work*, (as the Compiler calls it,) Nauticus cannot say; but can assure him, that three years ago a copy could not be procured.

The remainder of his postscript must fall so heavy upon the writer's head, Nauticus cannot wish to add to the weight there, though far more able to bear it than the cartilaginous gristle of his nose.

Nauticus holds the Board of Longitude, in general, in the highest esteem, and is fully sensible of the great utility of the Nautical Almanack, and must confess the Requisite Tables have their use. But why those mystical precepts? Did the Compiler think Lyons's and Dunthorne's demonstrations of no use? Are there not many navigators who understand geometry, &c. that must, mole-like, work in the dark, or purchase the old tables to enlighten themselves? For Urania's sake, let us make things as plain as possible. As, for example, why is not the reader told, in the explanation of Tab. XVI. for determining the latitude by two altitudes, that the logarithm of half the elapsed time is the cosecant of the time, reduced into degrees, &c. that the logarithm of the middle time is the sine of the same in degrees, added to the logarithm of 2, and the log-rising is the versed sine of the time in degrees; and why is not the demonstration added? For a minute let us look at the general introduction to the Requisite Tables, pages 1 and 2, and see how

we are to adjust a Hadley's quadrant: strangely, indeed! for the last adjustment is explained first, and the first not noticed. The dark glass is to be placed on the hither side of the little speculum, and that to be set parallel to the great speculum, how much soever the latter may incline from a perpendicular to the plane of the quadrant. This may account for some part of Mr. Compiler's error in his real observation, as he calls it, in N° III. Could any one have imagined, after what has been said on Hadley's quadrant by Mr. Ludlam, Magellan, and others, such an explanation would have been produced of that useful instrument. Mr. Compiler surely must know, that, if the index-glass be not perpendicular to the plane of the quadrant, the other adjustments will not enable him to measure an arc of a great circle truly. But enough of this. And now to the doctrine of non-entities, or a review of the surprising exemplifying problems; and first, in example III. page 30, Requisite Tables, there is given the altitude of the star $5^{\circ} 6'$, the altitude of the moon's centre $88^{\circ} 46'$, their apparent distance $89^{\circ} 58' 6''$; consequently the star's zenith distance $84^{\circ} 54'$, and the moon's zenith distance $1^{\circ} 14'$. These two zenith distances, with the observed distance, must either form a spherical triangle, or be in the same vertical: in either case, the true distance may be found; but we here see the observed distance greater than the sum of the other two by $3^{\circ} 50' 6''$; therefore it is impossible to draw a conclusion by any method whatever. The same example is pretended

to be solved by Dunthorne's method, page 35. *Surprising!* Example the IVth, pages 31 and 36, are more surprising still; for there one side is longer than the other two by $13^{\circ} 39' 5''$. This, as well as the former, if we believe Mr. Compiler, was taken from an actual observation; but he mistook 71 degrees for 41; yet 30 degrees are of no consequence to the conclusion. So far both Mess. Lyons's and Dunthorne's methods are improved, believe it who will.

But let us examine example II. pages 29 and 34. Here both objects are nearly in the same vertical, the one on one side the meridian, and the other on the other; consequently nothing more is necessary than to open the Requisite Tables, and take out the effect of parallax and refraction, for the moon $52' 3''$, and the same for the sun $5'$: their difference, $51' 58''$ subtracted from the observed distance, $90^{\circ} 21' 13''$, gives the true distance nearly, *viz.* $89^{\circ} 29' 15''$, which ought to be $89^{\circ} 29' 16'' \frac{1}{2}$. But the Compiler, in two extremely extreme exemplifying tedious solutions, makes the true distance by Lyons's method $89^{\circ} 29' 10''$, and by Dunthorne's method $89^{\circ} 29' 14''$; and no where hints the great advantage of taking the distance of the moon from the sun or star when they are nearly in the same vertical, though a case that may frequently happen, and save almost all the labour in determining the longitude.

And now for a word at parting: therefore, Mr. Compiler, instead of a modern insincere compliment,

ment, accept a little advice. If, by some peculiar conformation of your nature, you should feel any compunction, and yet be backward to forsake your erratic path, believe me, your character will run little hazard by a confession of your faults. Why, man, you have a wit on your side: dean Swift says, "A man, who confesses his error, does but confess that he is wiser to-day than he was yesterday."

Let these words of Horace, then, seek for an application among others:

Video meliora, proboque; deteriora sequor.

Embrace this new faith: *Do justice, and be esteemed!*

T H E E N D.